The Challenges Posed by Demographic Change in sub-Saharan Africa: A Concise Overview

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In the early years of the twenty-first century, economic growth in sub-Saharan Africa (henceforth Africa) was buoyant, with annual real GDP growth of close to 7 percent. The collapse of commodity prices and the slowdown in global economic growth have since adversely affected Africa's short-term prospects. Growth in 2015 and 2016 is expected to be about 3 percent, down from earlier years but still higher than in most other regions (IMF 2016). Our purpose is to outline the challenges that demographic change poses over the next 35 years, challenges that will need to be overcome or circumvented if countries in this region are to make rapid social and economic progress. The stakes are undoubtedly high. In 1950 the population of Africa comprised about 7 percent of the global total. By 2050, the equivalent proportion will be around 22 percent (UN Population Division 2015). What happens in Africa between now and mid-century will have both regional and global implications.

We take a cautious approach to our assessment of the region's future prospects given the wide diversity of the region. It contains 42 mainland nation states (plus nine mostly very small island nations) with very different economies, ethnic compositions, natural resources, climates, and political systems. No doubt, the future for some will be bright but not for others. To present a regional overview, we ignore much of this national variability of circumstances. However, the central forces of demographic change will be broadly similar across the majority of countries, and this similarity provides a justification for the regional perspective offered here. Moreover, poverty characterizes the majority of countries. Out of the 42 mainland states, 30 are classified as being "least developed" compared with only 14 similarly classified from all other world regions.

We start with a brief summary of projected population change between 2015 and 2050. Projections exist beyond the mid-century point but the range of possibilities becomes very wide and increasingly speculative. For these reasons, long-term scenarios will not be discussed. We then

TABLE 1 Sub-Saharan African demographic changes (2015–2050)

Age group/ indicator	Population size (millions)		Absolute change 2015–2050	Percent change 2015–2050	Percent distribution	
	2015	2050			2015	2050
0–4	157	251	93	59	16	12
5–19	359	668	309	86	37	31
20–64	416	1,100	684	164	43	52
65+	30	104	75	251	3	5
Total	962	2,123	1,161	121	100	100
Urban	360	1,137	782	215	37	55
Rural	590	938	344	58	63	45
Births	35	53	17	49	—	—
Growth rate (%)	2.71	1.90	—	—	—	—
Dependency ratio	86	62	–24	–28	—	—

SOURCE: United Nations, Department of Economic and Social Affairs, Population Division (2015). *World Population Prospects: The 2015 Revision, DVD Edition*.
United Nations, Department of Economic and Social Affairs, Population Division (2014). *World Urbanization Prospects: The 2014 Revision, CD-ROM Edition*.

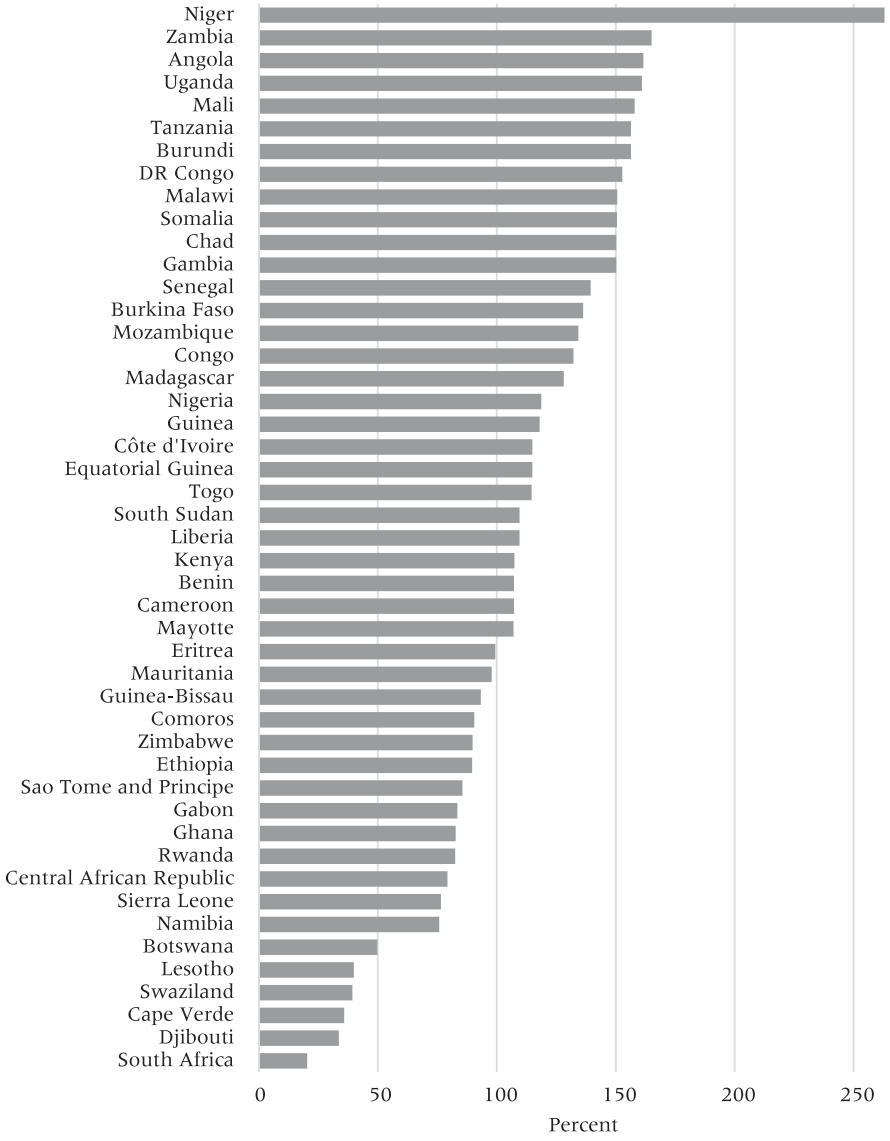
examine the challenges under the following headings: pressure on health and education provision; food security and agriculture; urban living conditions; employment and livelihoods; and intra-regional migration.

Demographic change, 2015–2050

Table 1 presents the key demographic changes between 2015 and 2050. They are based on the medium projection of the 2015 *World Population Prospects* and the 2014 revision of *World Urbanization Prospects*, both produced by the United Nations Population Division (UN Population Division 2014, 2015). At a regional level and over a period of a few decades, the UN projections have a good track record of predictive validity (Bongaarts and Bulatao 2000). Thus there is no reason to believe that the projections for Africa up to mid-century are seriously misleading, though the figures for specific countries will be subject to greater error.

The dominant feature of Table 1 is one of continued growth, albeit at uneven paces across age groups and urban–rural strata. Total population is expected to more than double in size. Figure 1 shows the degree of inter-country variability. Niger stands out as having by far the greatest expected proportionate increase in population, though, as discussed below, this outcome is highly improbable. Other countries with projected increases exceeding 150 percent are Zambia, Angola, Uganda, Mali, Tanzania, Burundi, and Democratic Republic of Congo. At the other end of the spectrum are the countries of Southern Africa with increases of less than 50 percent. The

FIGURE 1 Percent increase in population between 2015 and 2050 in sub-Saharan Africa



SOURCE: United Nations, Department of Economic and Social Affairs, Population Division (2015). *World Population Prospects: The 2015 Revision, DVD Edition*.

arguments in this article are much less relevant to Southern Africa than to other sub-regions.

Despite fertility decline, the expected number of births per year in the region will rise by 49 percent, from around 35 million in 2015, to 53 million in 2050, and the relative increase of infants and young children will be

somewhat larger. The number of children of primary and secondary school age, 5–19 years, will increase from 359 to 668 million, a rise of close to 90 percent. Men and women in the prime productive ages of 20–64 years will increase at a faster pace. The potential work force will be 2.6 times larger in 2050 than in 2015. The largest proportionate increase will occur among those aged 65 years or older, though this increase in absolute numbers is modest.

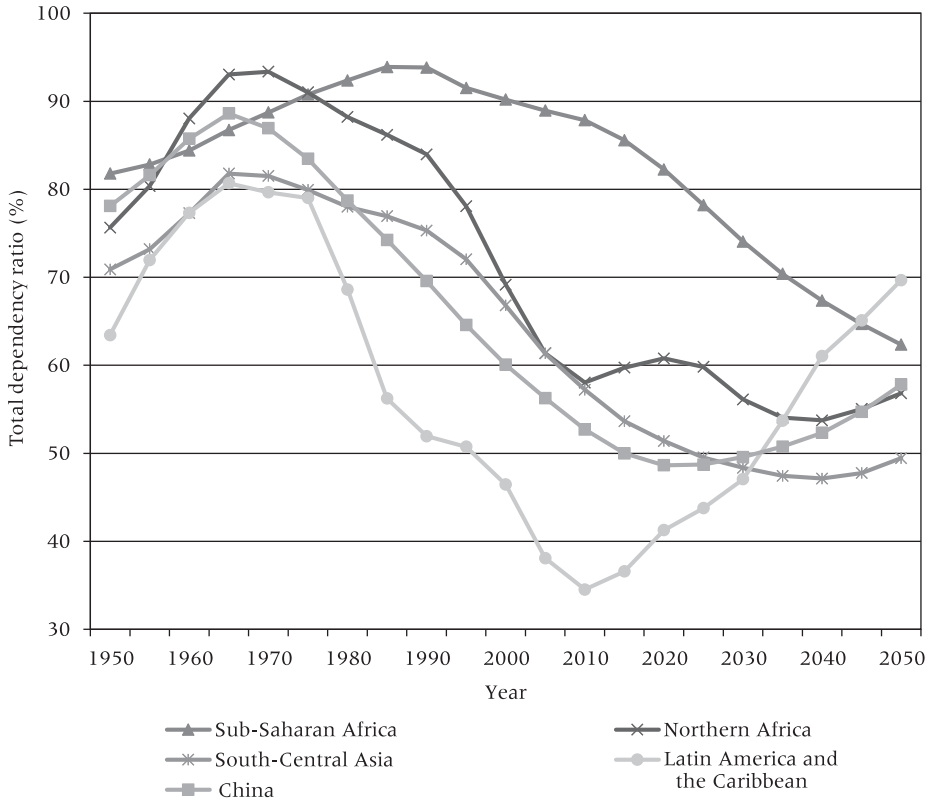
The single most significant expected change in population structure over these 35 years will be the urban–rural balance. The urban population is expected to expand three-fold from 360 million to 1,137 million, while the rural population will grow by a more modest 58 percent. In 2015, urban inhabitants comprised 37 percent of the total, and by 2050 this will have increased to 55 percent. The changes in age structure will be less pronounced. The population aged under 20 years will shrink from 53 to 43 percent, the over-65s will grow from 3 to 5 percent, and the share in the prime working ages will expand from 43 to 52 percent.

These changes in age structure are classically represented by the total dependency ratio, the number of those aged less than 15 or over 64 per hundred aged 15–64. Over the next 35 years this ratio will fall from 86 to 62, a drop of 28 percent. To put this change into global perspective, Figure 2 shows long-term trends in the dependency ratio for Africa compared with trends in other regions. It is immediately apparent that the fall in the ratio has been, and will continue to be, slower in Africa than elsewhere in the developing world and the ratio will remain higher for the next 35 years.

Expectations have been raised about the prospect of accelerated economic growth in Africa that may arise from falling fertility and declining dependency ratios, though such growth is contingent on other factors, notably appropriate policies. Other chapters in this volume address the prospects of a demographic dividend in Africa but there are at least three reasons for caution.

First, as shown above, the change in age structure is slow and thus it is unlikely that the demographic stimulus by itself will be sufficiently sharp to provoke rapid socioeconomic progress. Indeed, modeling by a World Bank team estimates only a modest boost to income per head resulting from faster growth in the labor force than in the entire population and from increased savings and investment. Between 2011 and 2030, the effect is estimated to be an increase of 0.4 percentage points in the real GDP per capita growth rate for the region as a whole (Ahmed et al. 2014). A similarly modest effect of an exogenous decline in the total fertility rate of 0.5 births per woman was estimated for Nigeria (Ashraf, Weil, and Wilde 2013). After 20 years, GDP per head would be higher by 5.6 percent, increasing to nearly 12 percent higher after 50 years. Over the 50-year period, the rate of growth in GDP per head would be raised by only 0.2 percent. Larger effects are found in the simulation model of Karra, Canning, and Wilde (in this volume). However,

FIGURE 2 Total dependency ratio, selected regions, 1950–2050



SOURCE: United Nations, Department of Economic and Social Affairs, Population Division (2015). *World Population Prospects: The 2015 Revision, DVD Edition.*

given the limited understanding of the mix of factors that drive economic growth and the unpredictability of global trends and policy directions, the results of all economic models of this type must be regarded as illustrative possibilities rather than predictions.

The second reason for caution originates in the simplifying dichotomy, assumed in most economic modeling of the demographic dividend, between a working population aged 15–64 and a dependent population outside these age limits. Labor force surveys show that the real situation is more complex and boundaries are blurred. For instance, the 2013 Ethiopian Labor Force Survey shows that, in rural areas, 64 percent of 10–14-year-olds were economically active and worked on average for 28 hours in the past week (Ethiopia, Central Statistical Agency 2014). The corresponding figures for those aged 20–64 were 89 percent and 34 hours. So the expected difference is present but it is not large, though, of course, children are not as productive as adults. In urban Ethiopia, by contrast, only 21 and 42 percent

of the population aged 10–14 and 15–19, respectively, are economically active compared with 81 percent of those aged 20–64 years, a reflection no doubt of greater urban than rural school participation and diminished opportunities for urban children to contribute to domestic enterprises. These Ethiopian data suggest that, as urbanization and secondary schooling increase in Africa, the direct contribution to GDP of 15–19-year-olds will diminish, thereby diluting the immediate advantage of changes in age structure.

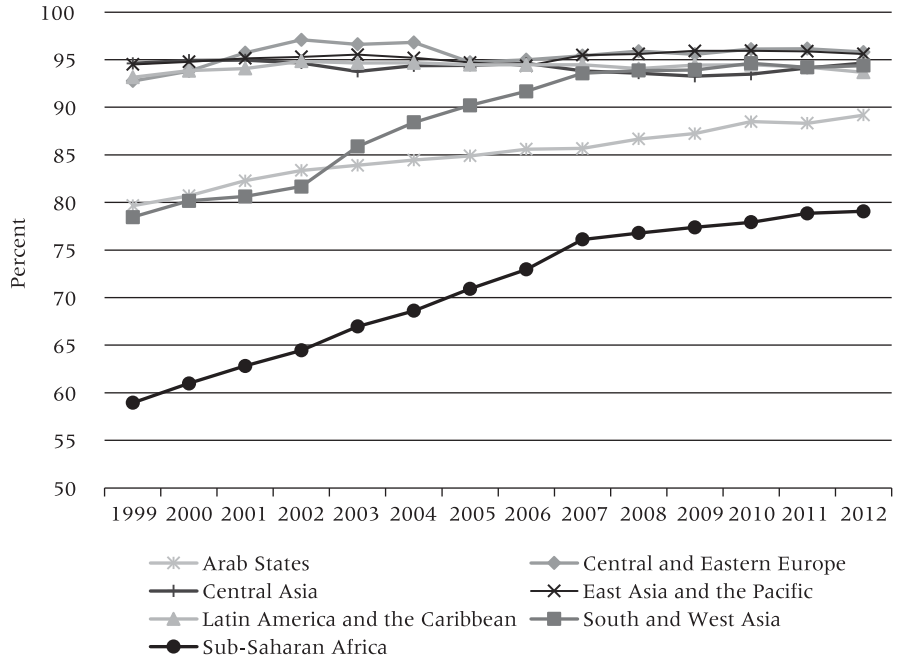
A third reason for caution concerns the productive potential of women, who, as family sizes fall, have greater opportunities to seek employment. This link between demographic change and production by women may be an important ingredient of the demographic bonus for Asia but is less plausible for Africa. Again the Ethiopian labor force survey is revealing. It shows that economic activity and hours worked among women are just as high in the peak reproductive ages of 20–29 as at other ages. This result is consistent with abundant research showing that production and reproduction are compatible in the largely agricultural and family-based economies of Africa. Moreover, an analysis of the work–fertility relationship showed no link between declining fertility in Africa from the early 1990s to 2005 and increased employment of women (Baschieri et al. 2009).

The preceding caveats are not intended to deny the advantages of declining fertility and changing age structure but rather to warn against naively optimistic expectations. However modest the short-term gains of declining fertility may be, continuation of current fertility levels, in the absence of a mortality resurgence, would result in an implausibly large end-of-century population in Africa of 14.7 billion (UN Population Division 2015). Continued fertility declines in this region are indispensable for a sustainable future, and faster declines would be more beneficial than slower ones.

Population pressure on human capital formation

It is widely held that improvement of human capital, notably health and education, is the key to social and economic progress. The importance of education has been demonstrated most recently by Lutz and colleagues (Lutz, Butz, and KC 2014; Cuaresma, Lutz, and Sanderson 2014). African countries have achieved marked improvements in primary school enrollments (UNESCO 2011). Between 1999 and 2009, net primary enrollment rose from below 60 percent to close to 75 percent and the gap between Africa and other regions narrowed (see Figure 3). In 2011, there were an estimated 3.2 million primary school teachers in Africa. To achieve universal primary schooling and educate increased numbers of children, set to rise by 9.5 million between 2011 and 2030, an extra 2.1 million teachers will be needed (UNESCO 2013).

FIGURE 3 Adjusted net enrollment rate for primary education, selected regions, 1999–2012

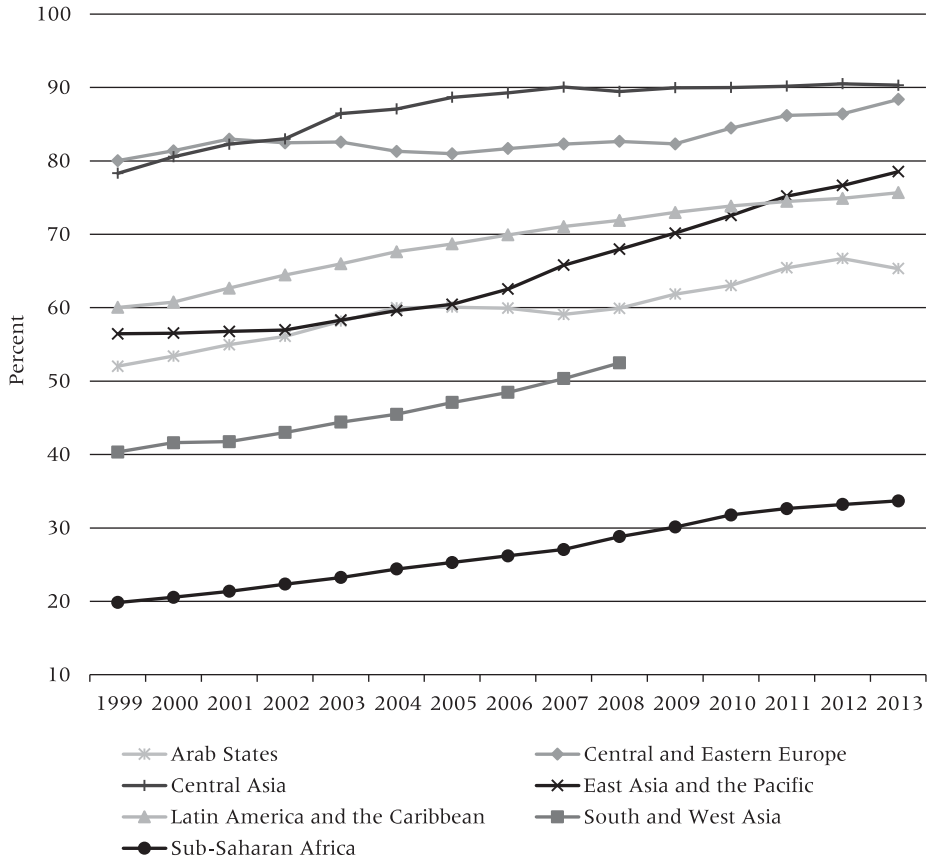


SOURCE: UNESCO Institute for Statistics, data extracted on 10 May 2015.

Improvements have also been recorded in secondary school enrollments, but on this dimension Africa lags well behind other regions and the gap is not narrowing (see Figure 4). Because of growing numbers graduating from primary schools, demand for secondary school places is increasing rapidly. Secondary schooling is more expensive than primary schooling and the budget allocations of many governments are insufficient to meet demand, with the consequence that attendance requires financial contributions from families. UNESCO (2013) estimates that the number of secondary school teachers will have to rise from one million in 2011 to 3.5 million by 2030 to achieve universal lower secondary education. To close the gap with other regions, particularly in secondary schooling, will thus require a major increase in expenditure on school buildings and teachers. Population growth will make the task more formidable. The school-age population (broadly 5–19 years) in Africa will increase by 8.8 million, or 2.5 percent, each year on average between 2015 and 2050.

Pursuit of enrollment targets may further erode the quality of schooling. In 2007, 18 percent of grade 6 students, on average, were rated illiterate in 14 East and Southern African countries with a range of 1.4 percent in Swaziland to 44 percent in Zambia (Hungi et al. 2010). Innumeracy

FIGURE 4 Net enrollment rate for secondary education, selected regions, 1999–2013



SOURCE: UNESCO Institute for Statistics, data extracted on 28 September 2015.

was worse with an average of 31 percent rated innumerate. Poor cognitive progress among students is a greater source of illiteracy and innumeracy than failure to reach grade 6 (Spaull and Taylor 2015). As shown by the OECD's Programme for International Student Assessment (PISA), over three-quarters of eighth- and ninth-graders in South Africa and Ghana did not surpass the lowest measure of proficiency in mathematics, compared with an international mean of 25 percent (Filmer and Fox 2014). Quality of teaching will be important but is jeopardized by the large increase in the school-aged populations.

Similar considerations apply to health. The maternal mortality ratio in Africa is estimated to be 510 deaths per 100,000 live births in 2013, far higher than in any other developing region. Skilled attendance at delivery is the key remedy and progress has been slow. The proportion of attended births rose from 40 percent in 1990 to 53 percent in 2012 (UN Statistical

Office 2014). Most African countries are not training enough physicians, nurses, and midwives. A detailed examination of 12 countries found that six were not training sufficient health staff in all three categories to maintain existing absolute numbers, and only three were training sufficient nurses and midwives to replace those leaving the labor force. Four countries were on track to increase numbers but not sufficiently to match population increase. Only two countries were likely to improve the ratio of staff to population (Kinfu et al. 2009). Inevitably, the steady increase in number of births, from 35 to 53 million per year over the next 35 years, will be an obstacle to maternal health improvements. Similarly, the 59 percent projected increase in the number of infants and young children will impose a strain on health budgets and staff. It is estimated that the health work force would need to increase by 10 percent per year to meet demand for health care between now and 2030, a rate of growth far higher than in other developing regions (WHO 2015).

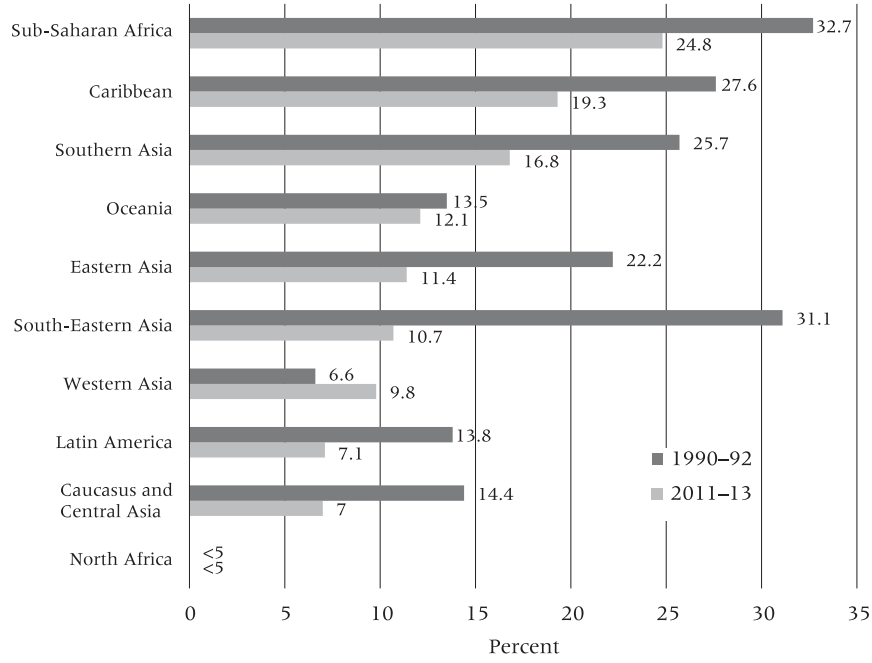
Of course, population increase does not make rapid improvements in human capital formation impossible but it does imply diversion of funds, by governments and by families, away from investments in the modernization of agriculture or industrialization, as argued decades ago by Coale and Hoover (1958).

Food security, agriculture, and climate change

Despite increased global consumption of meat and dairy products, driven by affluence, four crops account for 65 percent of world food intake: wheat, maize, rice, and potatoes. For much of the past century international prices for these staples have remained stable or have even fallen. Since 2002, however, prices have risen and become more volatile, partly because of crop failures in major producing areas and the diversion of land to biofuel production. These developments are seen by many experts as a signal of a new era of uncertainty in meeting demand for food (von Braun 2007; Godfray et al. 2010). This demand, set to increase by 70 to 100 percent between 2010 and 2050, is the result of population growth and change in diets. In a seminal paper, the joint challenges of eliminating hunger and meeting demand in an environmentally sustainable way were described as creating a "perfect storm" (Godfray et al. 2010).

These global considerations matter for Africa both because the continent has been importing increasing amounts of food and under-nutrition remains widespread. Since the 1970s Africa has been a net importer of food; between 1980 and 2007, net imports in real terms grew at 3.4 percent per year (Rakotoarisoa, Iafrate, and Paschali 2011). Population growth, and changing dietary preferences among urban populations, rather than increased consumption per head, account for most of this trend. While richer African countries, such as Botswana and Gabon, import more per head of

FIGURE 5 Prevalence of undernourishment, by region, 1990–92 and 2011–2013 (%)



SOURCE: FAO. *The State of Food Insecurity in the World*. 2013.

population than poor countries, all but a handful of poor African countries are net importers. On average, 31 percent of cereals consumed in 2008 were imported (African Development Bank Group 2009). Recent estimates of the total value of food imports range between US$30 billion and US$50 billion per year.

Increased food imports coexist with widespread under-nutrition. While there has been modest improvement since the early 1990s, an estimated 25 percent of Africa's population was undernourished in 2011–13, higher than in any other developing region (FAO 2013). Most countries with alarming measures on the global hunger index are in Africa (IFPRI 2014). As shown in Figure 5, nutritional gains have been greater in Southern, South-Eastern, and Eastern Asia than in Africa.

Although under-nourishment in the general population and stunting in children are not always closely related, the two indicators give a similar impression. In South-Central Asia, stunting prevalence fell from 61 percent in 1990 to 36 percent in 2010. By contrast, prevalence remained unchanged over this period at 38 percent in Western Africa, and fell from 48 to 45 percent in Eastern Africa and from 45 to 39 percent in Middle Africa (de Onis, Blossner, and Borghi 2012).

Africa is a predominantly rural, agricultural continent, with about two-thirds of employment derived from agriculture. Yet dependence on food imports has increased and hunger remains widespread. Whereas most Asian countries benefited from the Green Revolution that transformed agricultural yields, no such leap forward occurred in Africa; yields per hectare have remained static and domestic production has barely kept pace with population increase by extending cropland. Between 1985 and 2005, cereal production grew by 65 percent but population increased by 71 percent (Jayne et al. 2010). Little research has been done on genetic improvement of some key African crops, such as sorghum, millet, and teff. Use of fertilizers, irrigation, and mechanization is extremely low. Rural infrastructure is poor and thus marketing of surplus production is difficult. Access to credit for farmers has been very limited. Only in the last decade has the serious neglect of agriculture in development policies been acknowledged (World Bank 2007).

With Africa now facing a further doubling of population in the next 35 years, food availability will have to increase to a similar degree just to maintain existing nutritional standards and by more if hunger is to be reduced. Although food availability does not guarantee reduced hunger, particularly in the urban population where affordability is crucial, it is an essential precondition. And while the nutritional needs of growing populations do not necessarily have to be met by domestic production, the costs of escalating food imports would be a severe and probably unsustainable burden on all but the few wealthier countries.

The big question therefore is whether agricultural production in Africa can more than double between now and mid-century. Baseline yields are so low that reducing the barriers mentioned above provides a potential for rapid improvements. Taking into account availability of virgin land and assuming a doubling of yields, Alexandratos (2005) calculated that the majority of 11 African countries with particularly high population growth could increase cereal production per head by 2050. However, three major and less tractable obstacles to progress can be identified.

First, the rural population will continue to increase, leading to further declines in arable land per farmer in countries lacking virgin land that can be brought under cultivation. Soil in much of Africa has a bedrock of granite and gneiss and low inherent fertility. Its low clay content makes it susceptible to water and wind erosion. About two-thirds of arable land suffers from degradation and lowered soil fertility, and increased production depends on organic or mineral additions (Montpellier Panel 2014). Population pressure poses an obvious risk of over-cropping and over-grazing of fragile ecosystems, leading to further soil degradation and erosion.

Second, about 95 percent of African agriculture is rainfed and thus extremely vulnerable to climate change. Little is known about the nature and

threats of future climate change in sub-regions of Africa, but the strongest prediction of climate scientists is that extreme weather events, including droughts and floods, will become more frequent (Conway 2009). Better water capture and storage are essential but the scale of needed investment is daunting, and, at least in the short term, vulnerability to erratic rainfall will persist. In addition, many crops in Africa are grown close to their limits of thermal tolerance. Most estimates of the effects of temperature rise predict serious losses in production. One such study anticipates losses by mid-century of 22, 17, 17, 18, and 8 percent for maize, sorghum, millet, groundnut, and cassava (Schlenker and Lobell 2010).

Third, farm sizes are small and security of tenure often lacking. Average farm size in Africa is 1.8 hectares and falling (World Bank 2012). In six countries of East and Southern Africa, the ratio of cultivated land to the agricultural population has halved since the 1960s. In Kenya, Zambia, Malawi, and Mozambique, at least 25 percent of smallholder farms control less than half a hectare and are thus approaching landlessness (Jayne et al. 2010). The situation is even more acute in Rwanda and Ethiopia. Small farms tend to have higher yields per hectare but lower productivity per worker than large units. In many settings, small units are insufficient for subsistence, let alone the production of a surplus for sale, and economies of scale, such as attained through mechanization, are difficult to achieve. Using survey data from five East and Southern African countries, Jayne, Mather, and Mghenyi (2010) calculate that about half of small-scale farmers have no surplus staple grain to sell but rather have to buy. Moreover, small family farmers have no cushion against adversity and cannot afford the risk of innovation. Small farmers will increasingly have to rely on off-farm income or turn to high-value crops, such as fruit and vegetables. Collier and Dercon (2014) argue that the conventional emphasis on smallholder farms as the key to poverty reduction and increased output, epitomized by the World Bank's 2008 *World Development Report*, may be misguided because larger commercial farms have critical advantages in terms of access to new technologies and finance and in trading, marketing, and storage.

A related concern is insecurity of ownership or tenure. It is estimated that ownership of only 10 percent of land is registered, leaving many farmers open to land expropriation and abuse by corrupt officials (Byamugisha 2013). Moreover, insecurity of tenure acts as a disincentive to investments for the long term, such as terracing or tree planting. In Ethiopia and Rwanda land registration programs that gave farmers greater security had significant impacts on willingness to invest in soil and water improvements, thereby raising productivity, though no similar gains were found in Zambia (Byamugisha 2013; Sitko, Chamberlin, and Hichaambwa 2014).

Rapid urbanization without industrialization

Urbanization is an integral part of economic modernization and typically characterized as a structural shift from low-productivity agricultural work to higher-productivity activities in manufacturing and services. Some commentators have argued that Africa would benefit from higher rates of rural-to-urban migration (De Brauw, Mueller, and Lee 2014). Similarly, cities are often the engine of economic growth and innovation (Glaeser 2011), though it is doubtful whether this characterization applies in Africa, where urbanization is occurring in the absence of major industrialization. Large and growing concentrations of young people willing to work at low (by international standards) wages could act a magnet for foreign capital investment.

Whether or not this optimism is justified, the dismal living conditions of the majority of Africa's urban inhabitants are well documented and have been slow to improve. The proportion of the urban population using an improved sanitation facility has remained unchanged since 1990 at 41 percent. Similarly, the proportion living in slums has fallen only slightly from 70 percent in 1990 to 62 percent in 2012, where slums are defined by lack of at least one of the following conditions: access to safe water and improved sanitation, a dwelling made of durable materials, and two or fewer persons per room (UN Statistical Office 2014). By comparison, the proportion of the urban population living in slums is 35 percent in Southern Asia and 33 percent for all developing regions. The gap between Africa and elsewhere is stark.

A detailed account of factors that have contributed to this state of affairs is given by Collier and Venables (2013). They include: the high cost of raw materials for dwelling construction; lack of skilled construction workers; confused legal ownership of urban and peri-urban land; lack of appropriate credit institutions; and reluctance of political elites to encourage rural-to-urban migration by investing in infrastructure and low-cost housing. As a result, the typical urban dweller lives in a shack in a shantytown without roads, electricity, or sewerage. The dwelling is either rented from a slum landlord or self-built and self-financed. Collier and Venables argue that the failure to create a formal and regulated urban housing market in Africa is a significant missed opportunity. Elsewhere, the era of rapid urbanization has generated high levels of employment for both unskilled and skilled workers in the building of affordable houses.

Thanks to the surveillance system of the African Population and Health Research Centre in two Nairobi slums, more is known about slum dwellers in this city than elsewhere in Africa. Most inhabitants were born in rural areas and came to Nairobi because of limited rural opportunities (Zulu et al. 2011). A minority are long-term residents who have flourished, saving enough for education of children and investing in rural homesteads.

For the majority, spatial mobility is very high and life precarious. Half of all households are classified as food insecure. Injuries make a large contribution to overall mortality and morbidity and half of these are intentional. Road traffic accidents are the next largest contributor to this cause of death.

Africa's urban population is projected to grow at about 3.5 percent per year for the next 20 years, a rate of increase that implies a doubling in size every 20 years. The population pressure on urban housing, environment, and infrastructure will be relentless. In the absence of rapid economic growth and radical changes in policy priorities and urban governance, the prospect is one of continued large increases in the number of Africans who live in urban localities that lack most basic amenities and have high levels of violence and insecurity. The threat to social cohesion of increasing numbers of slum dwellers living close to small affluent urban elites is obvious.

Employment and livelihoods

Wage and salaried jobs, with legal contracts and a degree of job protection, account for about 10 percent of employment among African men in the formal public or private sector. Another 15 percent comprise wage jobs in the less formal sector. These proportions are lower for women. The bulk of work takes the form of self-employment, family employment, and micro-enterprises in agriculture or other activities. Commerce, or petty trading, accounts for 50–70 percent of non-agricultural activities, followed by manufacturing, food, and other services, typically based at home or on the street. A tiny minority evolve into larger enterprises but most are destined to remain at a precarious and low-income level (World Bank 2012). Unemployment is very low, simply because poor people cannot afford the option of inactivity. However, underemployment is pervasive. The evidence for Ethiopia is probably representative. Over one-quarter of rural residents complained of under-employment and about 50 percent of employed urban youth wished to work longer hours (Broussar and Tekleselassie 2012).

Within this context of an abundance of labor eking out precarious livelihoods on family farms or small-scale trading, Africa faces further very large increases in the adult population. The number of men and women aged 20–64 years will grow 2.5-fold in the next 35 years, with an average annual increase of 19.5 million. The fact that the prime working-age population will increase faster than the less productive age groups represents a small boost to GDP per head provided that productivity does not decline (Eastwood and Lipton 2011). The fall in fertility and family size is also an advantage because families with many dependents are more likely than others to slip into poverty and less likely to escape. The clear danger, however, is that the large increase in the labor force will simply swell the ranks of the self-employed with precarious livelihoods on farms and in petty trading.

Most African countries today are primarily agrarian in terms of employment but are rapidly urbanizing. According to Paul Collier, "Job generating industrialization has, up to now, been the only way out of national poverty" (2015, p. 39). If Collier is right, Africa's future depends to a large extent on the creation of jobs in labor-intensive manufacturing. By comparison, extractive industries, responsible for much of Africa's impressive GDP growth in recent years, generate few jobs and do not deliver inclusive growth. Thus far, Asia has reaped the benefit of globalization, specifically the movement of capital and dismantling of trade barriers, and become the world's factory. Africa's record of growth in manufacturing is poor and its share of global manufacturing has declined.

Can Africa gradually replace Asia as the world's center for labor-intensive, semi-skilled manufacturing? Africa's rapidly growing labor force is sometimes seen as a big advantage when set against declining labor forces in China and elsewhere. However, the population aged 15–64 years in Africa's competitors in Southern Asia and the low-wage economies of South-East Asia (Cambodia, Laos, Myanmar, and Vietnam) will continue to grow, from 1.3 billion in 2015 to 1.7 billion in mid-century (UN Population Division 2015). Global trends in the number of manufacturing jobs are disputed. The World Bank (2012) estimated a fluctuating total of 160–200 million such jobs between 1990 and 2008, with a modest underlying upward trend, and envisages future stability or even decline, largely because of productivity gains. By incorporating rough estimates of manufacturing in the informal economy, UNIDO (2013) concluded that the number of people involved in manufacturing rose from 300 million to nearly 400 million over the same time period. To the extent that the World Bank's prognosis is correct, Africa's growth in the working-age population is not a great advantage.

The answer to the question posed in the preceding paragraph depends on many factors. One analysis compared manufacturing firms in Africa with firms in other low-income countries and concluded that the poor performance in Africa could be largely attributed to inadequate infrastructure and lack of access to finance, factors that could be rectified in a reasonable time span (Harrison, Lin, and Xu 2014). Below we consider other factors, the most important of which are relative wage costs, productivity, skills of the working population, financial capital formation, and institutional capital, including political stability.

Relative wage costs versus productivity and cost of raw materials

Lack of reliable data precludes comparisons of African wage and non-wage costs of labor in manufacturing to the costs elsewhere. However, a detailed comparison of Ethiopia, Tanzania, and Zambia with China and Vietnam

is revealing. Wages for skilled and unskilled workers in China, averaged across six light manufacturing sectors, are higher than in the other countries (Dinh et al. 2012). This differential reflects the trebling of real wages in East Asia between 2000 and 2011, compared with an 18 percent growth in Africa (ILO 2014). However, Vietnam and Tanzania had similar wage levels while Zambia's wages were higher than Vietnam's. Only Ethiopia had a large cost advantage compared with Vietnam. One cannot assume that most African countries enjoy a wage-cost advantage over future competitors that, in addition to Vietnam, will include Bangladesh, India, Nepal, and Cambodia. Moreover, any wage-cost advantage disappears when productivity and the cost of raw materials are taken into account. In furniture production, for instance, Chinese workers produce 4.5 chairs per day, Vietnamese 1.9, and Ethiopians 0.3 (Dinh et al. 2012). In addition, the costs of most raw materials, such as timber, steel, and cotton, are higher in Africa than in East Asia, mainly because of poorly developed primary industries and high import tariffs.

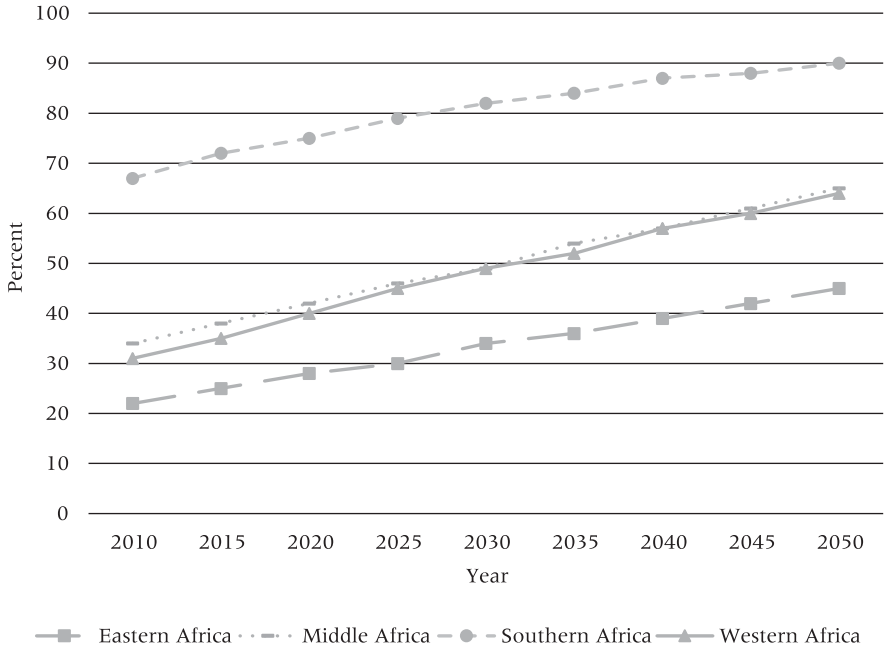
Labor force skills

The skills and productivity of the labor force are probably more important for industrial development than wage levels. Cognitive skills in literacy, mathematics, and problem solving are an indispensable foundation, learned in formal schooling. According to the central education projections produced by the Wittgenstein Centre, the proportion of the adult population in Africa with at least some secondary or higher schooling will roughly double between 2015 and 2050, except in Southern Africa where this fraction is already high (www.wittgensteincentre.org/dataexplorer). As shown in Figure 6, two-thirds of adults in Middle and Western Africa, 90 percent in Southern Africa, and 45 percent in Eastern Africa are projected to have reached secondary school or higher by mid-century. This bodes well for human capital. However, as mentioned earlier, number of years in school does not necessarily translate into cognitive attainment, and African educational systems have been criticized for neglect of vocational and technical training that is needed for the expansion of manufacturing (ILO 2009, 2012).

Capital formation and investment

Industrialization and the modernization of agriculture require capital, for which there are three main sources: domestic savings, foreign direct investment (FDI), and remittances. Increased domestic savings, whether achieved by declines in dependency ratios or not, has been an important contributor to accelerated economic growth in Asia. As shown in Figure 7, Africa's net savings expressed as a percent of gross national income fell between the late 1970s and the late 1990s but has risen sharply in the

FIGURE 6 Percent of population with some secondary or higher education, both sexes, sub-Saharan Africa, 2010–2050



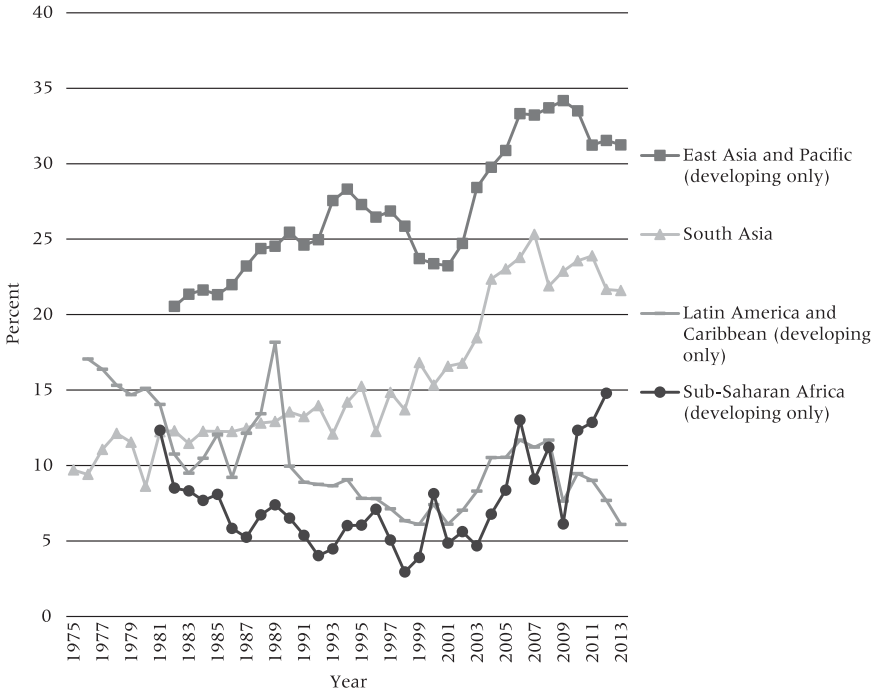
SOURCE: Wittgenstein Centre for Demography and Global Human Capital (2015). Wittgenstein Centre Data Explorer Version 1.2.

past decade. Nevertheless, it is below the levels recorded in South Asia and well below the East Asian level, though not much different from Latin America. High transaction costs and an inefficient banking system may have been responsible for the historically low savings levels in Africa. These conditions are improving and it appears that savings are responding to a more conducive environment.

Net FDI trends for countries in Africa are also encouraging, showing a 17-fold increase from about US$2,206 million per year in the early 1990s to $36,700 million for 2010–2013. However, the developing countries in East Asia and the Pacific, and to a lesser extent Latin America, still capture the lion's share of net inward investment (Figure 8). Moreover, much recent FDI in Africa has been directed toward extractive industries with little effect on job creation.

Remittances to Africa are relatively small, estimated to comprise only 4 percent of all remittances to developing countries (Gupta, Pattillo, and Wagh 2009). In most countries, they amounted to 3 percent or less of GDP in 2000–6, the main exceptions being Lesotho, Gambia, Guinea-Bissau, Togo, and Senegal.

FIGURE 7 Net national savings as percent of gross national income, 1975–2013



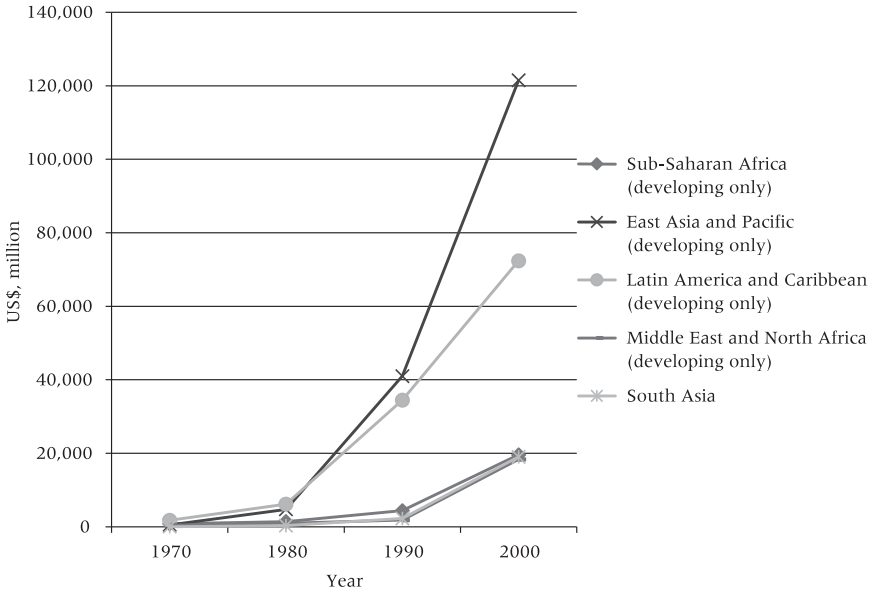
SOURCE: World Bank. 2015. *World Development Indicators*. Washington DC. http://data.worldbank.org/data-catalog/world-development-indicators.

Despite positive trends in domestic savings and FDI, Africa is not investing the 25 percent of GDP thought to be necessary to sustain an economic growth rate of 7 percent. Specifically, investment (gross fixed capital formation) in Africa (including North Africa) was 17.7 percent of GDP in the period 1990–1999, rising slightly to 18.7 percent in 2000–2011 (UNCTAD 2014). The average for all developing countries for the more recent period was 26 percent.

Institutional capital

A skilled labor force and adequate financial capital will fail to lead to improved employment in the absence of institutional capital. This term covers a broad range of components including political stability with the prospect of peaceful transitions of power; appropriate economic policies; a reasonably efficient state bureaucracy; and effective financial and legal systems. One analysis concluded that Africa's poor economic performance was mainly due to low institutional quality, including lack of trade openness (Sachs and Warner 1997). The presence of political leaders who are genuinely

FIGURE 8 Foreign direct investment, net inflows (current US$), 1970–2000



SOURCE: World Bank. 2015. *World Development Indicators*. Washington DC. http://data.worldbank.org/data-catalog/world-development-indicators.

committed to improving the welfare of the population at large rather than serving the interests of small elites is of paramount importance, though impossible to quantify. The exceptional recent economic performance, including job creation, of Ethiopia and Rwanda supports the Sachs–Warner conclusion. Both countries are landlocked and lack mineral resources yet have recorded rapid improvements under regimes that are clearly determined to improve general living standards.

By general consent, policy frameworks have improved greatly in the past decade or so, symbolized by the endorsement by heads of states of a New Partnership for Africa's Development (NEPAD) and the Africa Union's Agenda 2063. But huge problems remain. The international assessment of the legitimacy and effectiveness of national governments classifies 22 African countries as being among the world's 28 highly fragile states (Marshall and Cole 2014). Similarly, the World Bank's assessment of business environments ranks 12 African countries, including two of the most populous (Nigeria and DR Congo), as among the worst-performing 10 percent of 189 countries (World Bank 2015). Of the mainland states only South Africa, Rwanda, Ghana, Botswana, and Namibia appear in the higher-performing 50 percent.

Diverse socioeconomic pathways and population mobility

The socioeconomic pathways of African countries are diverging. Consider the progress of Ghana and the regress of the Central African Republic. Divergence will undoubtedly continue. Some countries will graduate from least-developed to middle-income status. Others will be overwhelmed by rapid population increase and may face a Malthusian future where populations cannot be sustained. Yet others may be trapped in continuing poverty and hunger by inept governments and civil strife, a scenario exacerbated by population growth but not necessarily caused by it.

Of the group of problem countries, those in the Sahel figure prominently. The combined populations of Chad, Mali, and Niger are projected by the United Nations Population Division to grow from around 50 million in 2015 to close to 150 million by mid-century. All three countries have fragile governments and problems of internal security, face periodic food shortages, and are extremely vulnerable to climate change (Potts, Henderson, and Campbell 2013). It is improbable that agricultural production will be able to keep pace with population increase or that exports will be sufficient to fund massive imports of food. International assistance will be unable to cope with such vast numbers in need. If this prognosis is valid, the predictable response will be emigration. A small number of individuals will have the means to emigrate to Europe, but the majority will cross adjacent borders, to Nigeria for instance.

A likely, but rarely discussed trend in Africa between now and mid-century is increased intra-regional movement, involving not thousands but possibly millions. A key question is whether cross-border migration will provoke violence. When a common culture and language unite both migrants and the host community, as with Fulani speakers in Northern Nigeria and adjacent countries, the prospects are good; when this source of cohesion and solidarity is lacking, they are potentially alarming.

Concluding comments

Because the fertility decline in Africa has been so slow, the dominant demographic force for the next 35 years will be continued growth in numbers of births, young children, the school-age population, and adults. To be sure, growth of the adult population will outstrip that of the younger age groups. This change in age structure is a positive development but the demographic signal is too weak to be a decisive influence on socioeconomic progress.

We have outlined the implications of continued population growth for pressure on health and education services; the need to feed a population

that will double in size; the danger that rapid urbanization will outstrip efforts to improve living conditions; the challenges of employment and productivity for an adult population that will be 2.5 times larger in 2050 than today; and the prospect of mass migration within the region due to Malthusian factors or chronic failure of some countries. None of these implications represents insuperable barriers to progress but, considered together, they underscore the magnitude of the task ahead. Success will depend above all on political will and sound governance. The examples of Ethiopia and Rwanda have shown what can be achieved by effective, albeit somewhat despotic, governments in raising welfare and reducing poverty.

Improving agricultural production is perhaps the most tractable challenge. Yields are so low in much of Africa that the investment in infrastructure and technology should pay high dividends. Demand from an increasing urban population will help, at least for farmers with access to markets in towns and cities. A concern is further fragmentation of farm sizes attributable to population increase, but the main threat is climate change. Most farmers will remain extremely vulnerable to erratic rainfall, and, in the longer term, temperature rises could spell disaster.

The least tractable challenge concerns employment and livelihoods. The impressive economic growth of the past decade has not been driven by any significant increase in manufacturing. Instead, the growing labor force has been absorbed into farming and the service sector, predominantly in the form of household enterprises. The structure of African economies has hardly changed since 1980, and manufacturing has declined as a percent of GDP since the 1990s. It is doubtful whether most African countries can maintain progress in the long term without a rapidly growing industrial base, of which there is yet little sign. The global number of formal-sector jobs in manufacturing is not growing rapidly, so the mere increase of Africa's labor force by itself is not an advantage. Africa will have to compete with other low-wage regions and countries for international capital and expertise. Success will have to be hard won.

It is probable that some countries will have a bright future but that other, mainly landlocked states will remain mired in poverty and hunger as a result of Malthusian factors or poor governance. Anticipation of mass migration within the next 35 years is justified, and whether this can occur without civil strife is one of the big uncertainties for the region.

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